

November 29, 2000

Members of the Senate Energy, Utilities and Communications Committee  
Members of the Senate Budget and Fiscal Review Committee  
Members of the Senate Appropriations Committee  
Members of the Assembly Utilities and Commerce Committee  
Members of the Assembly Budget Committee  
Members of the Assembly Appropriations Committee  
California State Capitol Building  
Sacramento, California 95814

**Re: *California Energy Commission's Quarterly Report Concerning  
The Public Interest Energy Research (PIER) Program***

Dear Members:

In accordance with Public Resources Code Section 25620.5(h), the California Energy Commission hereby transmits its Quarterly Report regarding the Public Interest Energy Research (PIER) Program for the period July 1 through October 30, 2000. The enclosed report provides the required evaluation of the progress and a status of the PIER Program's implementation for this quarter.

*Please note:* In accordance with Senate Bill 1299 (Chapter 536, Statutes of 2000), the Commission hereby begins its transition from a *quarterly* reporting cycle to a *semi-annual* reporting cycle for the PIER Program. The Legislative Analyst has requested that future semi-annual PIER Program reports be submitted on or before June 1 and December 1 of each year.

To date, the Energy Commission has made substantial progress in meeting the goals of the PIER Program, as demonstrated by the early results of PIER-funded projects that will help advance science and technology to improve the quality of life for California citizens. Should you have questions or comments concerning this report, please feel free to contact Tim Schmelzer, Assistant Director for the Commission's Office of Governmental Affairs, at 654-4942.

Respectfully submitted,

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**ARTHUR H. ROSENFELD**  
Commissioner and Presiding Member  
Research, Development and  
Demonstration Committee

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**ROBERT A. LAURIE**  
Commissioner and Associate Member  
Research, Development and  
Demonstration Committee

Enclosure  
cc: Legislative Analyst's Office

# **California Energy Commission's Quarterly Report Concerning the Public Interest Energy Research Program (July 1 through October 30, 2000)**

In accordance with Public Resources Code (PRC) Section 25620.5(h), this document constitutes the California Energy Commission's Quarterly Report for the Public Interest Energy Research (PIER) Program, covering the period from July 1 through October 30, 2000. This report provides the required "evaluation of the progress and a status of the PIER Program's implementation" for this past quarter. It also provides input for the Energy Commission's more detailed *Annual Report Concerning the Public Interest Energy Research Program* (hereafter referred to as *Annual PIER Report*) required pursuant to PRC Section 25620.8.

*Please note:* In accordance with Senate Bill 1299 (Chapter 536, Statutes of 2000), the Commission hereby begins its transition from a *quarterly* reporting cycle to a *semi-annual* reporting cycle for the PIER Program. The Legislative Analyst has requested that future semi-annual PIER Program reports be submitted on or before June 1 and December 1 of each year.

## **I. SUMMARY STATUS OF THE PIER PROGRAM**

As specified in PRC Section 25620, the primary mission of the PIER Program is to "improve the quality of life of this State's citizens . . . [by funding] public interest energy research, development and demonstration [RD&D] projects that are not adequately provided for by competitive and regulated energy markets." The funds for this program, totaling approximately \$61.8 million annually, come from the electricity ratepayers of specified investor-owned utilities and are held in the PIER Program Trust Fund Account.

The Commission's Research, Development and Demonstration (RD&D) Committee initially reviews the Energy Commission's decision related to the PIER Program.

During the past quarter of 2000, the PIER Program accomplished the following:

- The renewable energy program area developed a programmatic solicitation entitled "Making Renewables Part of An Affordable And Diverse Electricity System." This solicitation will be released in the fourth quarter of 2000. The solicitation will award up to \$18 million over three years.
- The buildings energy efficiency program area released a solicitation for \$3 million, targeted at the residential buildings sector.
- The Energy Commission signed a \$1.4 million Interagency Agreement with the University of California, Irvine, to fund three separate projects in the PIER environmentally preferred advanced generation program area.

- The Energy Commission approved a \$74,999 contract augmentation to continue developing appropriate interconnection requirements for distributed generation.
- The RD&D Committee approved a \$1,100,479 contract with W. Brandt Goldsworthy & Associates to develop a lighter weight transmission conductor that will be able to transfer more electricity per unit of weight.
- The Energy Commission received a draft Final Report concerning a PIER-funded project, which was successfully completed under the environmentally preferred advanced generation program area.
- The PIER staff began preparing the Integrated Public Interest Energy Research Plan and related Five-Year Investment Plan for the Legislature, as required by Senate Bill 1194 (Sher, Chapter 1050, Statutes of 2000) and Assembly Bill 995 (Wright, Chapter 1051, Statutes of 2000).

Further details concerning the Energy Commission's PIER Program activities for the past quarter of 2000 are provided below.

## **II. TRANSITION FUNDING STATUS REPORT**

In 1998, the Energy Commission awarded approximately \$17 million to 39 separate "transition" projects covering the six PIER program areas. Of the 39 transition projects, 37 have been completed, and one was cancelled as of the end of the fourth quarter of 1999. The one remaining transition project will be completed within the next year.

During the past quarter, written reports on all completed transition projects were received and reviewed. These reports will be published electronically, in hard-copy, and on CD ROM. For further details on these completed transition projects, please refer to Appendix A of the *1999 Annual PIER Report*.

## **III. PIER PROGRAM AREA FUNDING STATUS REPORT**

### **A. Renewable Energy Technologies**

During the past quarter, the PIER renewable energy technology team evaluated the EPRI staff's draft market analyses and benefits. Based on those evaluations and discussions with stakeholders, the team developed a programmatic solicitation focused on making renewable energy part of an affordable and diverse electricity market. The intent of the solicitation is to encourage electric service providers to coordinate technology development to produce renewable technologies that provide high value to electricity users in California. The solicitation will award up to \$18 million over a three-year timeframe to three projects. Target groups include ratepayers with few existing alternatives for controlling their electricity use (e.g., residential and small commercial customers) who reside in high rate electricity service regions (e.g., San Diego, the Bay Area, Los Angeles, etc.).

In addition, the PIER renewable energy team has updated research plans in each of the major technology areas (wind, solar, geothermal, biomass). These plans are currently in draft form and will be reviewed in the fourth quarter by outside experts and stakeholders. The plans form the basis for future directions in the renewable energy program area.

#### B. Environmentally-Preferred Advanced Generation

In July of 2000, the Energy Commission approved a \$1.4 million Interagency Agreement with the University of California, Irvine for three environmentally preferred advanced generation (EPAG) projects concerning:

1. Protocols for Microturbine Generators,
2. Fuel Cell Steady State Analysis Tools, and
3. Fuel Cell and Fuel Cell/Microturbine Hybrid Dynamic Modeling

The objective of these projects is to accelerate the successful implementation of microturbine generators and fuel cells in distributed generation applications. These technologies will reduce emissions and costs, improve power quality and reliability, conserve fuel, and expand customer choice in California. These projects are consistent with the EPAG team's Research and Development Plan and proposed funding for 1999/2000. (The fuel cell steady state analysis tool project is a continuation of a completed PIER project described below).

Also during this past quarter, the National Fuel Cell Research Center (NFCRC) at the University of California, Irvine, submitted a draft final report for a project entitled *Analyses and Technology Transfer for Fuel Cell Systems*. The project's scope involved two technical tasks:

1. Analyses of Fuel Cell Systems and Cycles and
2. Technology Transfer

Under the first task, the NFCRC successfully developed three computer simulations that will be incorporated into a complete fuel cell modeling program. When completed, the modeling program will facilitate the design and testing of more economical and more efficient fuel cell electricity generation systems. Under the second task, the NFCRC successfully installed advanced audio-visual, telecommunications and meeting room accommodations to facilitate technology transfer of information about fuel cell systems.

During this past quarter, the EPAG team also continued its planning and preparation for a new solicitation (now scheduled for release in late 2000) targeting microturbines and fuel cells.

#### C. Buildings End-Use Energy Efficiency

During the past quarter of 2000, the PIER buildings energy efficiency team completed a comprehensive analysis of funding to date in this program area. The buildings team evaluated how well current PIER funding is addressing the identified issues, building types, customer

classes, end-uses, and other factors. Based on the results of this analysis, the building team released a programmatic solicitation for \$3 million, targeted at the residential buildings sector. The buildings team is currently evaluating proposals received from this solicitation and anticipates awarding three programmatic contracts in early 2001.

In addition, the buildings team is funding the development of an indoor air quality research plan involving state and national experts in the field. This indoor air quality plan will be completed in early 2001, and may be followed by a solicitation in the latter part of 2001 for proposals related to the identified priority research needs.

#### D. Industrial/Agricultural/Water Energy Efficiency

During the past quarter, the industrial/agricultural/water energy efficiency team evaluated, and the RD&D Committee approved a \$352,200 sole source proposal from the Lawrence Berkeley Laboratory and California Institute of Energy Efficiency for RD&D for designing energy efficient “clean rooms.” The goal of this project is to develop resources and tools to help “clean room” and laboratory facility designers and operators achieve a 50% energy reduction in energy use.

Laboratories and “clean rooms” are prevalent in both public and private sector buildings serving semi-conductor, electronics, bio-pharmaceutical and many other growing sectors of the economy. Such facilities have to be decontaminated to an extremely high degree to eliminate very small particles and biohazards. All of these facilities are extremely energy intensive.

Laboratories and “clean rooms” are crucial to California’s high-technology industries. This project will help this California growth sector better manage its energy bills without compromising product quality and indoor air-quality.

The Energy Commission will consider this project for full approval at a Business Meeting in December 2000; a contract is expected to be in place by the end of January 2001.

#### E. Energy Related Environmental Research

During this past quarter the energy related environmental research team worked extensively with the University of California to develop a focused spending priority plan in this PIER program area. It is anticipated that additional funding solicitations in this area will be released in the early part of 2001.

#### F. Strategic Energy Research

In July 2000, the Commission approved a \$74,999 augmentation to the PIER Strategic Energy Research Contract #700-99-010 with Onsite Sycom Energy Corporation. This augmentation added tasks to the contractor’s support of the CEC’s Order Instituting Investigation (OII) and the CPUC’s Order Instituting Rulemaking (OIR) on interconnection standardization and permit

streamlining for distributed energy resources.<sup>1</sup> As augmented, this PIER contract is now expected to provide a foundation for removing a significant barrier to competition in the electricity market. Specifically, developing a uniform interconnection performance standard will allow distributed energy resources to enter the market more cost effectively, and the standard will provide a consistent specification for future product development.

During the past quarter, the RD&D Committee approved the proposed \$1,100,479 sole-source contract from the strategic energy research program area, which the full Commission is scheduled to hear in December 2000. The strategic energy research program area anticipates Commission approval of this proposed contract with W. Brand & Goldsworthy & Associates. The purpose of this contract is to continue research begun under a previous PIER contract to determine the feasibility of using a transmission system-related composite reinforced aluminum conductor in applications currently dominated by steel reinforced aluminum conductors. The new conductor has advantages of higher ampacity loading and the potential for carrying digital signals for communications and conductor diagnostic purposes.

The overall goal of this project is to design, develop and demonstrate a combined power and data transfer concept that could potentially provide the backbone for a more reliable electrical power and broadband-data transmission network. This research supports the PIER program objective of improving the reliability of California's electricity system. This research may also result in the ability to reconductor existing transmission lines with a conductor that transfers more power per unit of weight, thereby reducing the related demand for non renewable natural resources.

#### **IV. PIER COLLABORATIVE RESEARCH FUNDING STATUS REPORT**

In 1998, the Energy Commission approved a one-year, \$1.5 million partnership with EPRI focused on funding collaborative research in seven key areas for California. Since its inception, the Energy Commission has augmented the funding to include 22 additional research areas for a total agreement of just over \$14 million. This partnership has been extended through 2002.

This collaborative funding with EPRI allows the Energy Commission to participate in guiding national RD&D activities in specified areas and will help to ensure that California continues to receive the benefits of these nationally funded RD&D efforts. Through this collaborative funding effort, the PIER Program supports California-specific electricity-related research in 27 target areas. During the past quarter, work in these various areas has proceeded as anticipated.

#### **V. PIER ENERGY INNOVATIONS SMALL GRANT FUNDING STATUS REPORT**

Through the Energy Innovations Small Grant Program, the Energy Commission has released seven solicitations to date. For the first five solicitations, the Energy Commission has approved

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<sup>1</sup> The initial work on this project began in January 2000 with a \$320,000 contract to streamline the interconnection requirements for distributed energy resources (DERs). The contractor's work has been deemed highly credible not only by the Commission but also by the utilities and DER manufacturers as well. The OII process has been more intense than originally anticipated; this augmentation allows the team in place to complete the collaborative streamlining work.

46 projects totaling over \$3.3 million. The sixth-round (00-02) proposals were submitted on July 28, 2000, and resulted in 40 new grant applications. Scoring was completed on October 27, 2000. The seventh-round solicitation (00-03) was released on August 31, 2000, and proposals were submitted on October 31, 2000. The current status of the PIER Small Grants Program is summarized in the table below:

<b>Energy Innovations Small Grant Program Funding Summary</b>					
Solicitation	Release Date	Due Date	Business Meeting Date	Grants Awarded	Funded
99-01	3/31/99	4/30/99	8/11/99	13	\$973,966
99-02	4/30/99	5/31/99	11/17/99	5	\$374,595
99-03	8/30/99	9/30/99	1/26/00	11	\$824,530
99-04	12/17/99	1/28/00	7/12/00	10	\$741,769
00-01	3/15/00	4/28/00	<b>9/20/00</b>	7	\$524,751
00-02	6/15/00	<b>7/28/00</b>	<i>Pending</i>		
00-03	<b>8/31/00</b>	<b>10/31/00</b>	<i>Pending</i>		

## VI. OTHER PIER PROGRAM ACTIVITIES

### A. Information Transfer/Reporting Activities

During the past quarter, the Energy Commission continued a collaborative effort with Science Applications International Corporation (SAIC) to redesign the PIER Program Web Site. The staff continues to provide program information to SAIC for input into the new Web Site. Although this project was not completed during the third quarter as originally planned, it is expected to be finalized within the next few months.

### B. Independent Review Panel for PIER Evaluation

PRC Section 25620.9(a) required the Energy Commission to designate an independent panel of experts by January 1, 1999, to conduct a comprehensive evaluation of the PIER Program. PRC Section 25620.9(b) required the Independent Review Panel to submit a preliminary report of its findings to the Legislature by March 31, 2000. The Panel met this requirement and submitted its preliminary report during the first quarter of 2000. A final report is due to the Legislature by March 31, 2001.

During this past quarter, the Independent Review Panel outlined its Final Report on the PIER Program in a public meeting held in September 2000. The Final Report is expected to contain the results of a project-by-project review of RD&D projects previously funded through the PIER Program, as well as a report on the PIER Program's progress in addressing the Panel's Preliminary Report findings.

## **VII. CONCLUSION**

The Energy Commission remains fully committed to administering the PIER Program in an efficient and effective manner that ensures public input and accountability. The PIER section of the Energy Commission's Web Site is a means of communicating with stakeholders and the public. The Web Site can be accessed at:

**<[www.energy.ca.gov/research/PIER/index.html](http://www.energy.ca.gov/research/PIER/index.html)>**

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